

CLAIMS

1. A method of making a pressure transducer having
a closed chamber having a flexible flat diaphragm
5 defining one side, a support cup including a flat
base mounted within the closed chamber with the flat
base parallel to and selectively spaced from the
diaphragm, a pressure sensor mounted within the
closed chamber, the closed chamber including an
10 inlet bore including an outer enlarged diameter
portion, a first reduced diameter portion extending
a selected distance inwardly from said enlarged
diameter portion towards said closed chamber ending
at a second further reduced diameter portion, and a
15 pressure supply path means for delivering fluid
pressure from a hole in a pressurized pipe to the
diaphragm including a piercing needle, support means
for supporting the piercing needle for displacement
into a pipe to pierce the pipe, and bore means
20 extending from a first location surrounding the
piercing needle to a second location communicating
with the diaphragm the method comprising
applying a preload pressure to the pressure
supply path to displace the diaphragm from its
25 relaxed state to a deflected position against the
flat base to reduce the volume of the closed chamber
by a selected volume,
while maintaining the preload pressure applying
a vacuum to the inlet bore by opening a valve to
30 remove air from the chamber,

after a vacuum is established, closing the valve and filling the chamber with oil at least to the juncture of the first reduced diameter portion of the inlet bore and the enlarged diameter portion of the inlet bore,

forcing a ball smaller than the enlarged diameter portion and larger than the first reduced diameter into said first reduced diameter portion until the ball rests against the second further reduced diameter portion with the volume of oil pushed into the closed chamber being predetermined to be equal to said selected volume so that when the preload is removed, the diaphragm will be at its relaxed state, and

removing the preload pressure.

2. A pressure transducer comprising

a closed chamber having a diaphragm defining one side,

a pressure sensor mounted within said closed chamber with a space separating the pressure sensor and said diaphragm,

an inlet bore communicating with said closed chamber including

an outer enlarged diameter portion,
a first reduced diameter portion extending a selected distance inwardly from said enlarged diameter portion towards said closed chamber terminating at a second further reduced diameter portion,

a ball wedged into said first reduced diameter portion against said second further reduced diameter portion, and

a non-compressible liquid filling
said closed chamber,
said diaphragm being in the relaxed state.

5 3. A pressure transducer according to claim 2,
further comprising support cup means including a
flat base, said support cup means being mounted
within said closed chamber with said flat base
parallel to and selectively spaced from said
10 diaphragm.

4. A pressure transducer according to claim 3,
further comprising pressure supply path means for
delivering fluid pressure from a hole in a
15 pressurized pipe to said diaphragm including
a piercing needle,
support means for supporting said piercing
needle for displacement into a pipe to pierce the
pipe, and
20 bore means extending from a first location
surrounding the piercing needle to a second location
communicating with said diaphragm.